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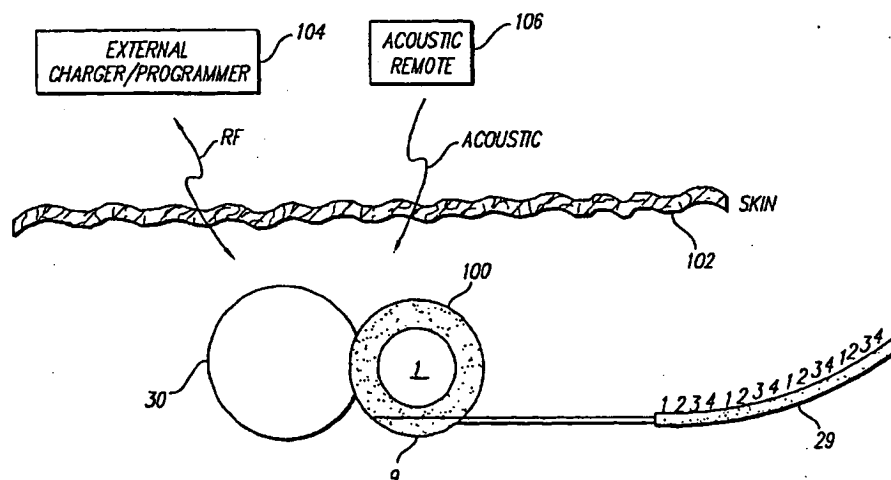
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HIGH CONTACT COUNT, SUB-MINIATURE FULLY IMPLANTABLE COCHLEAR PROSTHESIS



(57) Abstract: A fully implantable cochlear prosthesis includes: (a) an implantable hermetically sealed case (100) wherein electronic circuitry including a battery and an implantable microphone (1), are housed, (b) an active electrode array (29) that provides a programmable number of active electrode contacts through which stimulation current may be selectively delivered to surrounding tissue, preferably through the use of appropriate stimulation groups, and (c) a connector (9) that allows the active electrode array to be detachably connected with the electronic circuitry within the sealed case. The active electrode array provides a large number of both medial contacts and lateral contacts, any one of which may be selected to apply a stimulus pulse through active switching elements included within the array. The hermetically sealed case within which the electronic circuitry, battery, and microphone are housed may be replaced, when needed, through minimally invasive surgery. Further, the electronic circuitry housed within the hermetically sealed case may be programmed, as needed, using acoustic signals from an acoustic remote control (106) and/or RF control signals from an external programmer (104).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 814 095 A (LEYSIEFFER HANS ET AL) 29 September 1998 (1998-09-29) claims; figure 4	1,2,8-13
P,X	DE 199 15 846 C (IMPLEX HEAR TECH AG) 31 August 2000 (2000-08-31) claims; figures	1,2,8-13
X	US 4 729 366 A (SCHAEFER DONALD W) 8 March 1988 (1988-03-08) claims; figures	1
X	US 5 957 958 A (LOEB GERALD E ET AL) 28 September 1999 (1999-09-28) claims; figures	1
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 198 29 637 A (IMPLEX HEAR TECH AG) 20 January 2000 (2000-01-20) claims; figures ----	1-13
A	US 5 571 148 A (LOEB GERALD E ET AL) 5 November 1996 (1996-11-05) claims; figures ----	1-13
A	WO 97 01314 A (COCHLEAR LTD) 16 January 1997 (1997-01-16) claims; figures ----	1-13
A	US 5 443 493 A (FLEMING MATTHEW C ET AL) 22 August 1995 (1995-08-22) claims; figures ----	1
A	US 6 011 993 A (LAW TOM J ET AL) 4 January 2000 (2000-01-04) claims; figures ----	1
A	US 6 002 966 A (LOEB GERALD E ET AL) 14 December 1999 (1999-12-14) cited in the application column 9 - line 11; claim 65 claims; figures 1,3 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/10268

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5814095	A	29-09-1998	DE 19638158 A1	02-04-1998
			DE 19638159 A1	02-04-1998
			EP 0831673 A2	25-03-1998
			AT 208990 T	15-11-2001
			EP 0831674 A2	25-03-1998
DE 19915846	C	31-08-2000	DE 19915846 C1	31-08-2000
			AU 2226900 A	12-10-2000
			EP 1043914 A2	11-10-2000
			US 6198971 B1	06-03-2001
US 4729366	A	08-03-1988	DE 3780245 D1	13-08-1992
			DE 3780245 T2	18-02-1993
			DK 415887 A	12-02-1988
			EP 0263254 A1	13-04-1988
			ES 2033265 T3	16-03-1993
			FI 873460 A ,B,	12-02-1988
			NO 873328 A ,B,	12-02-1988
			US 4850962 A	25-07-1989
US 5957958	A	28-09-1999	US 5833714 A	10-11-1998
DE 19829637	A	20-01-2000	DE 19829637 A1	20-01-2000
			AU 2697099 A	20-01-2000
			EP 0969696 A2	05-01-2000
			US 6176879 B1	23-01-2001
US 5571148	A	05-11-1996	NONE	
WO 9701314	A	16-01-1997	AU 6182696 A	30-01-1997
			WO 9701314 A1	16-01-1997
			CA 2224199 A1	16-01-1997
			EP 0840581 A1	13-05-1998
			JP 2001508667 T	03-07-2001
US 5443493	A	22-08-1995	NONE	
US 6011993	A	04-01-2000	NONE	
US 6002966	A	14-12-1999	US 5601617 A	11-02-1997
			US 6219580 B1	17-04-2001
			AU 696916 B2	24-09-1998
			AU 5579396 A	18-11-1996
			CA 2218846 A1	31-10-1996
			DE 69614103 D1	30-08-2001
			EP 0823188 A1	11-02-1998
			JP 11504479 T	20-04-1999
			WO 9634508 A1	31-10-1996